

PROCEEDINGS
OF THE
CALIFORNIA ACADEMY OF SCIENCES
FOURTH SERIES

VOL. X, Nos. 11 AND 12, pp. 119-163

JULY 2, 1921

XI

Report of the President of the Academy
for the Year 1920

BY
C. E. GRUNSKY
President of the Academy

XII

Report of the Director of the Museum
for the Year 1920

BY
BARTON WARREN EVERMANN
Director of the Museum

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**REPORT OF THE PRESIDENT OF THE ACADEMY
FOR THE YEAR 1920**

By C. E. GRUNSKY
President of the Academy

In Academy affairs the year 1920 may be classed as relatively uneventful. Nevertheless some progress has been made.

The membership campaign under the leadership of Mr. M. Hall McAllister has continued successful. The number of members has increased from 550 to 927. There were 403 new members admitted while the loss of members was 20 by death, 5 by resignation, and 1 dropped for arrearages.

The present membership is made up of:

Patrons	12
Honorary Members	30
Life Members	82
Fellows	20
Members	783

The Academy carries on its list of patrons the following names:

Living

Mr. William B. Bourn	Mr. John W. Mailliard
Mr. William H. Crocker	Mr. Joseph Mailliard
Mr. Peter F. Dunne	Mr. M. Hall McAllister
Mr. Herbert Fleishhacker	Mr. Ogden Mills
Mr. Joseph D. Grant	Mr. Alexander F. Morrison
Mr. A. Kingsley Macomber	Mr. William C. Van Antwerp

Deceased

Mr. William Alvord	Mrs. Charlotte Hosmer
Mr. Charles Crocker	Mr. James Lick
Mr. John W. Hendrie	Mr. Ignatz Steinhart

Those who were called by death are as follows:

Mrs. Mary K. Brandegee.....	Life	April 3, 1920
Dr. John A. Brashear.....	Honorary	April 9, 1920
Dr. Frank S. Daggett.....	Member	April 5, 1920
Mr. I. W. Hellman.....	Member	April 9, 1920
Mrs. Charlotte Hosmer.....	Patron	November 30, 1920
Mr. G. Earle Kelly.....	Member	December 15, 1920
Mr. Curtis H. Lindley.....	Member	November 20, 1920
Mr. Bruce Martin.....	Member	1920
Mr. W. W. Montague.....	Life	September 28, 1920
Mr. Percy T. Morgan.....	Member	April 16, 1920
Mr. Charles P. Punchard.....	Member	November, 1920
Dr. Pier Andrea Saccardo.....	Honorary	February 12, 1920
Mr. Leon Sloss	Member	May 5, 1920
Mr. L. E. Smith.....	Life	October 12, 1920
Prof. Dr. H. zu Solms-Laubach.....	Honorary	1920
Dr. Franz Steindachner.....	Honorary	December 10, 1919
Mr. Sam B. Stoy.....	Member	August 18, 1920
Mr. Clement Tobin	Member	April 3, 1920
Dr. Ramsay H. Traquair.....	Honorary	November 22, 1912
Mr. Carlos Troyer	Life	July 26, 1920
Mr. Raphael Weill	Life	December 9, 1920

The Academy has published during 1920 the following papers in continuation of the Fourth Series of the Proceedings:

- Vol. II, Part II, No. XVII, pp. 311-345
DERMAPTERA AND ORTHOPTERA,
by Morgan Hebard.
- Vol. IX, No. XIII, pp. 331-356
NEW HEMIPTEROUS INSECTS OF THE GENERA ARADUS, PHYTOCORIS AND
CAMPTOBROCHYS,
by Edward P. Van Duzee.
- Vol. IX, No. XIV, pp. 357-365
REPORT OF THE PRESIDENT OF THE ACADEMY FOR THE YEAR 1919,
by C. E. Grunsky.
- Vol. IX, No. XV, pp. 367-396
REPORT OF THE DIRECTOR OF THE MUSEUM FOR THE YEAR 1919,
by Barton Warren Evermann.
- Vol. X, No. I, pp. 1-27
A FURTHER STUDY OF VARIATION IN THE GOPHER-SNAKES OF WESTERN
NORTH AMERICA,
by John Van Denburgh.
- Vol. X, No. II, pp. 29-30
DESCRIPTION OF A NEW SPECIES OF RATTLESNAKE (*Crotalus lucasensis*)
FROM LOWER CALIFORNIA,
by John Van Denburgh.
- Vol. X, No. III, pp. 31-32
DESCRIPTION OF A NEW SUBSPECIES OF BOA (*Charina bottæ utahensis*)
FROM UTAH,
by John Van Denburgh.
- Vol. X, No. IV, pp. 33-34
DESCRIPTION OF A NEW LIZARD (*Dipsosaurus dorsalis lucasensis*)
FROM LOWER CALIFORNIA,
by John Van Denburgh.

- Vol. X, No. V, pp. 35-46
UNDESCRIBED TIPULIDÆ (DIPTERA) FROM WESTERN NORTH AMERICA,
by Charles P. Alexander.
- Vol. X, No. VI, pp. 47-49
THREE NEW SPECIES OF DOLICHOPODIDÆ (DIPTERA) FROM CALIFORNIA
AND NEVADA,
by M. C. Van Duzee.
- Vol. X, No. VII, pp. 51-52
TWO NEW SPECIES OF SYRPHIDÆ (DIPTERA),
by A. L. Lovett.
- Vol. X, No. VIII, pp. 53-70
NOTES ON SOME UNDESCRIBED CALIFORNIAN HELICES,
by S. Stillman Berry.
- Vol. X, No. IX, pp. 71-75
A NEW GENUS AND SPECIES OF GRASSHOPPER FROM CALIFORNIA,
by Morgan Hebard.

During the year 1920, 11 free lectures have been delivered at the stated meetings of the Academy, as follows:

- JANUARY 7. "The Vegetation of New Zealand."
Mr. A. H. Cockayne, Government Biologist of New Zealand.
- MARCH 3. "American Aquariums."
Dr. Barton Warren Evermann, Director of the Museum, California Academy of Sciences.
- APRIL 7. "A Commodity Unit to Supplement Money as a Standard of Value."
Dr. C. E. Grunsky, President, California Academy of Sciences.
- MAY 5. "Some Bird Observations on the University Campus."
Mr. Tracy I. Storer, Field Naturalist, Museum of Vertebrate Zoology, University of California.
- JUNE 2. "The Work of the Audubon Society."
Mr. C. B. Lastreto, Organizer and Ex-President of the Audubon Association of the Pacific.
- JULY 7. "The Birds and Mammals of the Stikine Region, British Columbia."
Mr. H. S. Swarth, Curator of Birds, Museum of Vertebrate Zoology, University of California.
- AUGUST 4. "The Botanical Features of Mount Tamalpais."
Miss Alice Eastwood, Curator of Botany, California Academy of Sciences.
- SEPTEMBER 1. "Injurious Insects."
Mr. E. O. Essig, Assistant Professor of Entomology, University of California.
- OCTOBER 6. "Hunting Grizzlies with Bow and Arrow."
Dr. Saxton Pope, Assistant Clinical Professor of Surgery, University of California.
- NOVEMBER 3. "The Pan-Pacific Scientific Congress and the Hawaiian Islands."
Dr. Barton Warren Evermann, Director of the Museum, California Academy of Sciences.
- DECEMBER 1. "Birds, Fur Seals, Foxes and Other Animals of the Pribilof Islands, Alaska."
Dr. G. Dallas Hanna, Curator of Invertebrate Paleontology, California Academy of Sciences.

The Sunday afternoon lectures delivered in the Museum building during 1920 have included the following:

- JANUARY 4. California's Fur-Bearers.
Dr. H. C. Bryant, in charge Education and Publicity, California Fish and Game Commission.
- JANUARY 11. Life History of the Little Smelt or Grunion.
Mr. W. F. Thompson, in charge State Fisheries Laboratory, California Fish and Game Commission.
- JANUARY 18. The Game Warden and His Work.
Mr. J. S. Hunter, Assistant Executive Officer, California Fish and Game Commission.
- JANUARY 25. The Commercial Fisheries of California.
Mr. N. B. Scofield, in charge Commercial Fisheries Department, California Fish and Game Commission.
- FEBRUARY 1. The Ocean as an Abode of Life.
Dr. W. K. Fisher, Director, Hopkins Marine Station of Stanford University.
- FEBRUARY 8. The Steinhart Aquarium.
Dr. Barton Warren Evermann, Director of the Museum, California Academy of Sciences.
- FEBRUARY 15. The Ocean Meadows, or the Microscopic Life of the Open Sea.
Dr. C. A. Kofoed, Professor of Zoology, University of California.
- FEBRUARY 22. Fishes of the California Coast.
Prof. E. C. Starks, Assistant Professor of Zoology, Stanford University.
- FEBRUARY 29. Marine Mammals.
Dr. Harold Heath, Professor of Zoology, Stanford University.
- MARCH 7. Alaska and the Fur Seals.
Dr. Barton Warren Evermann, Director of the Museum, California Academy of Sciences.
- MARCH 14. Life of the Deep Sea.
Prof. J. O. Snyder, Associate Professor of Zoology, Stanford University.
- MARCH 21. Oceans of the Past.
Dr. J. P. Smith, Professor of Paleontology, Stanford University.
- MARCH 28. Systematic and Economic Phases of California Marine Algæ.
Dr. N. L. Gardner, Assistant Professor of Botany, University of California.
- APRIL 4. Life Between Tides.
Dr. W. K. Fisher, Director, Hopkins Marine Station of Stanford University.
- APRIL 11. Plant Migrations.
Dr. Douglas H. Campbell, Professor of Botany, Stanford University.
- APRIL 18. The California Big Trees and History.
Dr. L. L. Burlingame, Associate Professor of Botany, Stanford University.
- APRIL 25. Some Plant Diseases.
Prof. J. I. W. McMurphy, Assistant Professor of Botany, Stanford University.
- MAY 2. The Trees of California.
Dr. Leroy Abrams, Associate Professor of Botany, Stanford University.

- MAY 9. Plants and a Hungry World.
Dr. George J. Peirce, Professor of Botany and Plant Physiology, Stanford University.
- SEPTEMBER 12. The Origin of the Polynesian People.
Dr. W. E. Safford, Bureau of Plant Industry, Department of Agriculture, Washington, D. C.
- SEPTEMBER 19. A Recent Visit to the Hawaiian Islands.
Dr. Barton Warren Evermann, Director of the Museum, California Academy of Sciences.
- SEPTEMBER 26. The Solar System.
Dr. W. W. Campbell, Director, Lick Observatory, Mount Hamilton, California.
- OCTOBER 3. Comets.
Dr. A. O. Leuschner, Dean of the Graduate Division, University of California.
- OCTOBER 10. The Binary Stars.
Dr. R. G. Aitken, Astronomer, Lick Observatory, Mount Hamilton, California.
- OCTOBER 17. The Nebulae.
Dr. J. H. Moore, Astronomer, Lick Observatory, Mount Hamilton, California.
- OCTOBER 24. What We Owe to Animal Experimentation.
Dr. S. J. Holmes, Professor of Zoology, University of California.
- OCTOBER 31. Early Ideas of the Earth.
Prof. Earle G. Linsley, Professor of Geology and Astronomy, Mills College.
- NOVEMBER 7. The Spectroscope—A Key to Celestial and Atomic Mysteries.
Dr. E. P. Lewis, Professor of Physics, University of California.
- NOVEMBER 14. Some Phases of Our Modern Conquest of the Air.
Dr. W. F. Durand, Professor of Mechanical Engineering, Stanford University.
- NOVEMBER 21. The Future of the Tropics as a Factor in World Development.
Dr. R. S. Holway, Professor of Geography, University of California.
- NOVEMBER 28. Cipher Messages from the Stars.
Dr. J. H. Moore, Astronomer, Lick Observatory, Mount Hamilton, California.
- DECEMBER 5. Earthquakes on the Pacific Coast of North America.—I.
Dr. S. D. Townley, Professor of Applied Mathematics, Stanford University.
- DECEMBER 12. Earthquakes on the Pacific Coast of North America.—II.
Dr. S. D. Townley, Professor of Applied Mathematics, Stanford University.
- DECEMBER 19. The United States in Haiti and Santo Domingo.
Mr. M. E. Beall, Berkeley, California.

Ground has not yet been broken for the Steinhart Aquarium. This is not due to any lack of desire on the part of the Council and the Trustees to further its early construction. The trust which the Academy has accepted will be faithfully discharged. More than a year ago the bequest became available and the sum of \$250,000 was paid to the

Academy. This sum was at once invested and interest has been accumulating. Dr. Evermann, accompanied by Civil Engineer T. Ronneberg, has made an inspection trip to all the notable aquariums in the United States in order that the Academy may have the advantage of the latest and best ideas on general arrangement, lighting and operation. The architect, Mr. Lewis P. Hobart, thereupon made a number of preliminary studies from which it presently became apparent that the funds at our disposal were not adequate to provide a building of the size, dignity and architectural finish which would be required if the aquarium is given the place of honor in the Academy's building scheme. It was found impracticable, in other words, to put the aquarium to the East of the unit in which our present exhibits and activities are housed, where it could be made, if funds permitted, an imposing central feature at the rear of an aquatic court. When this fact became apparent the architect did the next best thing. He so arranged a design that only a small portion of the exterior of the building would require finishing in stone. But even with this arrangement under which only a narrow front of the building would be architecturally ornamental, there has been difficulty in finding a site at once appropriate and acceptable to the Board of Park Commissioners. The matter of selecting a site and of suggesting a building suited to the site is now in the hands of a joint committee of the Park Commission and of the Academy.

It is regrettable that the funds placed by bequest at the disposal of the Academy are limited to an amount which will not give to San Francisco all that is desired in connection with a first class, fully equipped aquarium in which the marine life of the Pacific Ocean and the aquatic life of the streams which flow into the Pacific Ocean should be adequately represented. Even with extreme restriction of the exterior ornamentation of the aquarium building it will not be possible to provide more than about 50 tanks of moderate size. There will be no space provided in accomplishing this result for fishery and display exhibits, for research work, or for offices. The bare housing of the fish tanks, and of the machinery and appliances required to store, filter, aerate and cool or heat the water, is all that can be accomplished with the means at command.

Some thought has been given to combining with the aquarium an auditorium or otherwise bringing under the same roof space that may be used for other purposes, without in any sense detracting from the distinctiveness of the Steinhart Aquarium. Nothing along this line seems possible of accomplishment. The aquarium once established will always be the "Steinhart Aquarium." Enlargement or extension by other bequests or endowments is not likely so long as the features added by such bequests or endowments are not sufficiently distinctive to perpetuate the names of those whose generosity prompts their making. Nor does it seem likely that the City, which is the beneficiary, could be prevailed on in the near future to increase the initial fund. Nevertheless, before it is too late, this thought is thrown out. It would indeed be a gracious thing if the City which has authorized the Academy to accept the bequest and to take charge of the erection and operation of an aquarium in Golden Gate Park, would add a like amount. It would thereby make possible the erection of a dignified structure adequate for immediate needs and arranged for expansion to meet any future requirements.

The financial standing of the Academy will appear from the Treasurer's report. The endeavor of the Council and of the Trustees has been to do the utmost that could be done within our resources as well in the matter of adding to the material in the Academy's collections as in research work and the publication of results. What has been done along these lines will appear more fully from the report of Dr. Evermann, the Director of the Museum, and the reports of the curators of the various departments.

As you were advised a year ago our floating debt which had been incurred during the erection of the Museum building, had been wiped out in 1919. This year we note with satisfaction that our indebtedness on the Academy's Market Street property has been reduced by \$10,000, from \$300,000 to \$290,000.

For a grizzly bear habitat group, as was noted in the President's last annual report, funds have been provided by Mr. Ogden Mills and the necessary specimens for the group have now been secured from the Yellowstone Park without

expense to the Academy, by Dr. Saxton Pope, assisted by Arthur Young and G. D. Pope. Permission was granted by the Park authorities to get four grizzly bear for this purpose. It is expected that before the close of this calendar year the group will be installed. It will fill the last available alcove and, thereafter, the need for more exhibit space will be felt more than ever.

The Academy is a growing institution, as yet but inadequately equipped to carry on the activities which should be its special concern. It should have more housing facilities for scientific and educational natural history material. It should be engaged in carrying natural history lessons into the school rooms of the city and it should have better facilities for popular lectures on scientific subjects. Despite the present inadequate facilities the weekly lectures (Sunday afternoons) have proved very successful. Their scope appears from the list submitted. They are attended to the limit of our small auditorium's seating capacity. I am sure that I voice the sentiments of all members and friends of the Academy who have attended any of these lectures, when I say that the kindness of those who have given the lectures, frequently at no little personal inconvenience, has been sincerely appreciated.

In the President's last annual report note was made of the fact that on appeal to the Supreme Court, the will of Mr. S. F. Thorn under which the Academy was bequeathed some land near Santa Cruz and other property, had been sustained. It was subsequently learned that this decision was not rendered by the Court *in banc*. Upon further hearing, the Court *in banc* reversed the earlier decision, finding that the will was not holographic because the single word "Cragthorn" had been inserted with a rubber stamp. The will was declared illegal and it now appears that the announcement of last year was at fault and that the Academy takes nothing under the will.

Among the notable acquisitions of the Academy during the year is the W. Otto Emerson collection of bird skins, some 5300 in number. Most of the birds represented in this collection, which has great scientific value, are from Alameda County. It has come to us through the generosity of W. H. Crocker and John W. Mailliard.

Private subscriptions by a number of friends of the Academy have made possible the purchase of the Albert Prager Herbarium, which contains many valuable plant specimens from various parts of the globe. Negotiations for the transfer of this herbarium from Leipzig, Germany, the home of Mr. Prager, to the Museum of the Academy, have been completed.

Your officers again commend the zeal and ability with which the curators of the Academy's departments have conducted their work, which goes so far in maintaining the standing of the Academy as a scientific institution of real worth. Your officers are appreciative too of the interest taken by the membership in the activities of the Academy, and are gratified to note how popular the museum has become as evidenced by the large number of visitors reported by the Director of the Museum.

The Academy stands ready to enlarge its usefulness. It can do so materially, however, only through outside help. As opportunity offers this fact should be made known to those who are so circumstanced that they can serve mankind by establishing endowments for useful purposes. They should know that the Academy is ready to serve.

XII

REPORT OF THE DIRECTOR OF THE MUSEUM FOR
THE YEAR 1920

BY

BARTON WARREN EVERMANN

Director of the Museum

The annual report of the Director for the year 1919 was presented to the Academy at the annual meeting February 18, 1920. At that time all except one of the spaces for large habitat groups in the mammal and bird halls had been filled. The one remaining space has been reserved for a Grizzly Bear Group. The grizzly bear is now extinct in California. None of us will ever see a living example of that magnificent animal which figured so prominently in the early history of the State; it is said there is no really good specimen of the species in any museum in the world. It has therefore been decided to put in a habitat group of a closely related species (*Ursus imperator*) which occurs in the Yellowstone Park. Dr. Saxton Pope (a member of the Academy) of San Francisco, offered to secure the necessary animals, without expense to the Academy, if the necessary permit were secured. Application was made to the National Park Service for a permit for Dr. Pope to kill the necessary animals, the permit was obtained, and Dr. Pope secured the animals. The taxidermists have begun the preparation of the group which, it is believed, will be completed by September, 1921.

When Mr. Ogden Mills visited the Museum recently he was so pleased with what the Academy has already accomplished in habitat group installation that he generously gave his check to the Academy for \$5000 to cover the cost of the proposed Grizzly Bear Group. It is very gratifying to know that this Museum is so appreciated and the Academy feels grateful to Mr. Mills for this expression of his appreciation.

Small Habitat Groups.—With the completion of the Grizzly Bear Group all the available spaces for large groups will have been utilized. There will remain only spaces for 24 small panel

groups—five in the bird hall and 19 in the mammal hall. It is hoped that all these may be completed within the next few years.

PERSONNEL

Only a few changes have taken place in the personnel of the Museum within the year. Mr. William Heim, who was employed as taxidermist, took indefinite leave August 16, 1920, on account of ill health. It is hoped he may be able to return at an early date. Mr. Francis G. Gilchrist, who was employed May 10, 1920, as assistant in the department of Ornithology and Mammalogy, resigned July 30 to re-enter the University of California. Harvey R. Scott was employed as assistant taxidermist from July 28 to August 20. Chase Littlejohn has been employed as assistant curator, department of Ornithology and Mammalogy, since September 13.

The employes of the Academy at this date are as follows: Dr. Barton Warren Evermann, Director and Executive Curator of the Museum, and Editor; W. W. Sargeant, Secretary to the Board of Trustees; Miss Susie Peers, Secretary to the Director; Joseph W. Hobson, Recording Secretary; Miss Alice Eastwood, curator, Department of Botany; Edward P. Van Duzee, curator, Department of Entomology, and assistant librarian; Dr. John Van Denburgh, curator, Department of Herpetology; Dr. Roy E. Dickerson, honorary curator, Department of Invertebrate Paleontology; Dr. G. Dallas Hanna, curator, Department of Invertebrate Paleontology; Dr. Walter K. Fisher, curator, Department of Invertebrate Zoology; Joseph Mailliard, curator, Department of Ornithology and Mammalogy; Joseph R. Slevin, assistant curator, Department of Herpetology; Chase Littlejohn, assistant curator, Department of Ornithology and Mammalogy; Mrs. Marian L. Campbell and Mrs. Kate E. Phelps, assistants, Department of Botany; Mrs. Helen Van Duzee, assistant, Department of Entomology and in the Library; Miss Mary E. McLellan, Library assistant; William Heim, assistant, Department of Exhibits (on leave); John I. Carlson, general assistant; Raymond Smith, general assistant; Georges Vorbe, Merle Israelsky, and William Barbat, temporary assistants, Department of Invertebrate Paleontology; William

C. Lewis, janitor; Fred Maag, carpenter and assistant janitor; George W. Edwards, assistant janitor; Frank W. Yale, night watchman; Mrs. Johanna E. Wilkens, janitress; Patrick J. O'Brien, day watch; Archie McCarte, night watch.

ACCESSIONS TO THE MUSEUM AND LIBRARY

Accessions to the Museum and the Library have been unusually numerous and valuable, as is shown by the detailed list in the appendix to this report (pp. 149-158).

VISITORS TO THE MUSEUM

In accordance with established policy, the Museum was open to the public every day in the year. The attendance by months for each of the years since the Museum was first opened to the public is shown in the following table:

Month—	1916	1917	1918	1919	1920
January		23170	25260	17241	27013
February		22058	23698	19586	23450
March		31606	26810	27397	25419
April		32175	23274	25994	32208
May		26154	26391	28369	37107
June		32123	29843	32248	36207
July		37193	31420	48028	52492
August		24619	31137	43730	53470
September	16448 ¹	27866	29847	34007	42413
October	36933	20629	14743 ²	30463	33500
November	27718	21810	8531 ²	25246	19347
December	15002	21693	19588	21246	21340
Total.....	96101	321096	290542	351497	403566

A comparison of the number of visitors to the Museum of the California Academy of Sciences with those who visited the Smithsonian Institution and the National Museum at Washington in the year ending June 30, 1920, will prove very interesting. The visitors by months are given in the following table, which shows that the number visiting the Smithsonian Institution was only 21 per cent of those visiting the Academy Museum; the number visiting the Natural History Building of the National Museum was only 4.7 per cent. greater than that at the Academy, while that at the Arts and Industries Building of the National Museum was only 62 per cent of that at the Academy. These figures should be very gratifying to us.

¹ Attendance from September 22 to 30.

² Museum closed 29 days on account of the "flu."

NUMBER OF VISITORS BY MONTHS FOR THE YEAR ENDING
JUNE 30, 1920

AT THE

MUSEUM OF THE CALIFORNIA ACADEMY OF SCIENCES
THE SMITHSONIAN INSTITUTION

AND

NATIONAL MUSEUM IN WASHINGTON, D. C.

Year and Month	California Academy of Sciences	Smithsonian Institution	United States National Museum	
			Arts and Industries Building	Natural History Building
1919				
July.....	52,492	7,812	24,755	33,631
August.....	53,470	9,594	29,501	45,392
September.....	42,013	9,690	29,697	44,974
October.....	33,500	7,245	21,401	36,906
November.....	19,347	5,875	18,971	38,420
December.....	21,340	4,992	13,149	23,751
1920				
January.....	27,013	4,264	11,491	22,914
February.....	23,450	3,439	10,168	21,740
March.....	25,419	6,371	15,815	32,204
April.....	32,208	8,121	23,207	38,954
May.....	37,107	9,978	27,556	46,089
June.....	36,207	8,632	25,271	38,009
Total.....	403,566	86,013	250,982	422,984

COOPERATION WITH SCHOOLS

The Museum continues to cooperate with the public and private schools. Teachers and school officials are coming to realize more and more clearly that the Museum can be of real service to the schools. The number of schools visiting the Museum increases each year. During the year 1920 there were schools from San Francisco, Berkeley, Oakland, Alameda, Piedmont and Richmond, and classes from San Jose, San Rafael, San Anselmo, San Mateo, and Stockton. Whenever possible, the Director or some one of the Museum staff accompanies the school through the Museum and explains briefly the general features of the installations, calling at-

tention to the educational value of the various exhibits, and then, when time permits, the class is taken into the lecture hall and shown moving pictures or stereopticon slides illustrative of some of the exhibits.

The visits by schools in the year have been as follows:

Schools of San Francisco

Number of classes	280
Number of teachers with the classes.....	270
Number of pupils	19920

Schools outside of San Francisco

Number of classes	26
Number of teachers with the classes.....	18
Number of pupils	444
Total number of classes	306
Total number of teachers	288
Total number of pupils	10364

THE PAN-PACIFIC SCIENTIFIC CONGRESS

Under the auspices of the Pan-Pacific Union, the First Pan-Pacific Scientific Congress met at Honolulu August 2 to 21. The Director of the Museum attended the Congress, as a member of the Pacific Explorations Committee of the National Research Council and representing also the California Academy of Sciences and the Pacific Division of the American Association for the Advancement of Science. He sailed from San Francisco July 28 and returned September 8. August 3 to September 1 were spent attending the sessions of the Congress and visiting places of interest on the islands of Oahu and Hawaii.

The number of delegates and others in attendance upon the sessions of the Congress was more than 100. There were present delegates from New Zealand, Australia, the Philippines, China, Japan, Canada, England, and the United States, many of those from the United States representing various scientific bureaus of the Government.

The papers and discussions at the sessions of the Congress covered many phases of the geology, meteorology, and natural history of the Pacific and its contained islands, and it was clearly shown that much of importance remains to be learned

regarding the hydrography, geology, and natural history of the Pacific.

At the close of the Congress the unanimous verdict was that the meeting had been a decided success, and that other meetings should be held every two or three years.

FIELD WORK OF THE MUSEUM STAFF

Within the year the Museum carried on a number of field investigations, as fully set forth in the reports of the curators.

MEETING OF THE PACIFIC DIVISION OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ITS AFFILIATED SOCIETIES

The 1920 meeting of the Pacific Division was held at Seattle, June 17 to 19. All the sessions of the Association and of its affiliated societies were held in various halls of the University of Washington. The Academy membership was well represented, at least 25 of its members being present. The Director of the Museum was in attendance as vice-president and chairman of the executive committee of the Pacific Division, and Secretary W. W. Sargeant as secretary of the Pacific Division. The Academy was represented on the programs by the following members:

Mr. W. F. Thompson	Dr. E. L. Packard
Dr. Barton Warren Evermann	Dr. Chester Stock
Prof. John N. Cobb	Dr. Wm. E. Ritter
Mr. W. E. Allen	Prof. Tracy I. Storer
Mr. Willis H. Rich	Dr. E. P. Meinecke
Dr. John C. Merriam	Dr. W. F. Durand
Dr. E. P. Lewis	Dr. J. R. Slonaker
Dr. J. W. Moore	Miss Alice Eastwood
Dr. R. G. Aitken	Dr. D. T. MacDougal
Dr. Bruce L. Clark	

Several others were in attendance.

USE OF THE ACADEMY'S COLLECTIONS AND LIBRARY BY INVESTIGATORS AND STUDENTS

Students and investigators continue to avail themselves of the facilities offered by the Academy for study and research. The Library, with its more than 50,000 books and pamphlets

in the various departments of science, is in almost daily use by students. This has been especially true of geologists and paleontologists, who are interested in oil investigations and prospecting. The large research collections in the different departments have been consulted by a number of investigators. Mr. L. M. Loomis continues to avail himself of the Academy's collections and Library in his study of sea birds. Messrs. Joseph Grinnell, Harry S. Swarth, Tracy I. Storer, and J. Eugene Law, of the Museum of Vertebrate Zoology, have had occasion to consult our collections of birds, mammals and reptiles. Numerous entomologists of the west coast make frequent use of the rapidly growing collections in that department, and the botanists of the coast find it to their interest to consult the herbarium.

The Boy Scouts, under Scout Master Harold E. Hanson, have continued the Friday night meetings at the Museum throughout the year. The Academy is glad to cooperate in this way.

PUBLICATIONS BY THE MUSEUM STAFF

The curators and other members of the Museum staff have continued active in research work and in their contributions to the scientific literature of their respective fields of investigation, as evidenced by the following list of titles of papers published by them in 1919-1920:

Evermann, Barton Warren

1. Nesting of the Wilson Snipe in California. <The Condor, Vol. XXI, No. 3, May-June (June 6), 1919, p. 121.
2. Large Set of Eggs of the Canada Goose. <The Condor, Vol. XXI, No. 3, May-June (June 6), 1919, p. 126.
3. California Trout. <California Fish and Game, Vol. V, No. 3, July, 1919, pp. 105-135, 4 colored plates, text-figures 36-46. (With Harold C. Bryant.)
4. The Northern Fur-Seal Problem as a Type of Many Problems of Marine Zoology. <The Scientific Monthly, Vol. IX, No. 3, September, 1919, pp. 263-282, 4 plates, 6 text-figures.
5. A Colony of Tricolor Blackbirds. <The Gull, Vol. I, No. 9, pp. 2-3, September, 1919.
6. The Steinhart Aquarium, San Francisco. <Aquatic Life, August, 1919, pp. 159-160, 1 plate.
7. Note on the Basking Shark. <Copeia, No. 74, October 15, 1919, pp. 77-78.

8. A Water-Fowl Habitat Group. <Museum Work, Vol. II, No. 2, November, 1919, p. 35, 1 plate.
9. Museum Exhibits of Real Value. <Outers' Recreation, Vol. LXI, No. 6, December, 1919, p. 435, 1 text-figure.
10. The Northern Fur-Seal Problem as a Type of Many Problems of Marine Zoology. <Bulletin No. 9 of the Scripps Institution for Biological Research of the University of California, pp. 13-26, December 15, 1919. (Differs somewhat from No. 4.)
11. Scientific and Economic Problems of the Mammals and Birds of the North Pacific. <Bulletin No. 9 of the Scripps Institution for Biological Research of the University of California, pp. 27-34, December 15, 1919.
12. Plans for the Steinhart Aquarium. <Pacific Fisherman, Vol. XVII, No. 12, December, 1919, p. 63, 1 text-figure.
13. A Mountain Sheep Habitat Group. <Forest and Stream, Vol. XC, No. 1, January, 1920, p. 32, 1 text-figure.
14. Birds' Nests in the Music Concourse, Golden Gate Park. <The Gull, Vol. II, No. 1, January, 1920, p. 3-4.
15. The Steinhart Aquarium, California. <The American Angler, Vol. V, No. 1, May, 1920, pp. 19-20, 1 text-figure.
16. Lake Maxinkuckee: A Physical and Biological Survey. The Department of Conservation, State of Indiana, Publication No. 7, Volume I, pp. 1-660, 9 halftone plates, 38 colored plates, 24 text-figures, 1 map; Volume II, pp. 1-512, 1920 (September) (with Howard Walton Clark).

Hanna, G. Dallas

1. The Introduction of *Acanthinula harpa* and *Circinaria vancouverensis* on St. Paul Island, Alaska. <The Nautilus, Vol. XXXIII, No. 4, p. 143, April, 1919.
2. Fossil Mollusks from the John Day Basin in Oregon. <University of Oregon Publications, Vol. I, No. 6, pp. 1-8, pl. I, August, 1920.
3. Report of the Department of Invertebrate Paleontology for 1919. <Proceedings of the California Academy of Science, Ser. 4, Vol. IX, Nos. 14-15, pp. 387-389, August, 1920.
4. New and Interesting Records of Pribilof Island Birds. <The Condor, Vol. XXII, No. 5, pp. 173-175, Sept.-Oct. (September 24), 1920.
5. Birds of the Alaska Fur Seal Islands. <The Gull, Vol. II, No. 12, December, 1920.
6. Census of Alaska Fur Seals in 1919. <Rept. U. S. Commissioner of Fisheries for 1919(1920). Bureau of Fisheries Document No. 891.

Mailliard, Joseph

1. Notes from the Feather River Country and Sierra Valley, California. <The Condor, Vol. XXI, p. 74, March 25, 1919.

2. Fly-catching Birds. <The Condor, Vol. XXI, p. 212, September 30, 1919.
3. Notes on the Avifauna of the Inner Coast Range of California. <Proc. Calif. Acad. Sci., Fourth Ser., Vol. IX, No. 10, pp. 273-296, November 25, 1919.
4. Birds returning to their Old Haunts. <The Condor, Vol. XXII, p. 38, January 26, 1920.
5. Effects of a Storm on the Bird Life of the Sea. <The Condor, Vol. XXII, p. 40, January 26, 1920.
6. Lincoln Sparrow in San Francisco, California. <The Condor, Vol. XXII, p. 43, January 26, 1920.
7. Bryant Marsh Sparrow upon the Hills. <The Condor, Vol. XXII, p. 63, March 22, 1920 (with John W. Mailliard).
8. Calaveras Warbler in San Benito County, California. <The Condor, Vol. XXII, p. 155, August 10, 1920.
9. A Correction concerning the Tawny Creeper. <The Condor, Vol. XXII, p. 158, August 10, 1920.
10. Notes on Nutcrackers in Monterey County, California. <The Condor, Vol. XXII, p. 160, August 10, 1920.
11. The Census of Birds' Nests in the Music Concourse in Golden Gate Park, San Francisco, California. <The Gull, Vol. III, No. 2, February 1, 1921.
12. Notes on some Specimens in the Ornithological Collection of the California Academy of Sciences. <The Condor, Vol. XXIII, p. 28, February 5, 1921.

Van Denburgh, John

1. The Garter-Snakes of Western North America. <Proc. Calif. Acad. Sci., Fourth Ser., Vol. VIII, No. 6, pp. 181-270, pls. 7-17, October 18, 1918 (with Joseph R. Slevin).
2. The Gopher-Snakes of Western North America. <Proc. Calif. Acad. Sci., Fourth Ser., Vol. IX, No. 6, pp. 197-220, pls. 11-13, August 21, 1919 (with Joseph R. Slevin).
3. A Further Study of Variation in the Gopher-Snakes of Western North America. <Proc. Calif. Acad. Sci., Fourth Ser., Vol. X, No. 1, pp. 1-27, pls. 1-2, August 6, 1920.
4. Description of a New Species of Rattlesnake (*Crotalus lucasensis*) from Lower California. <Proc. Calif. Acad. Sci., Fourth Ser., Vol. X, No. 2, pp. 29-30, pl. 3, August 6, 1920.
5. Description of a New Subspecies of Boa (*Charina bottæ utahensis*) from Utah. <Proc. Calif. Acad. Sci., Fourth Ser., Vol. X, No. 3, pp. 31-32, August 6, 1920.
6. Description of a New Lizard (*Dipsosaurus dorsalis lucasensis*) from Lower California. <Proc. Calif. Acad. Sci., Fourth Ser., Vol. X, No. 4, pp. 33-34, August 6, 1920.

Van Duzee, Edward P.

1. Report of the Canadian Arctic Expedition, Vol. III, Insects, F, Hemiptera, Ottawa, 1919, 5 pages.
2. New Hemipterous Insects of the Genera *Aradus*, *Phytocoris*, and *Camtobrochys*. <Proc. Calif. Acad. Sci., Fourth Ser., Vol. IX, No. 13, pp. 331-356, February 5, 1920.

DEPARTMENT REPORTS

The curators and their assistants have been unusually active and efficient during the year in building up and caring for the collections in their respective departments, as is fully set forth in their respective reports.

DEPARTMENT OF BOTANY

The herbarium of the California Academy of Sciences now numbers 67,789 mounted specimens representing 18,825 species, an increase during the year of 8,200 specimens and almost 2,000 species. The chief accessions are as follows:

By purchase.—160 specimens from Rev. John Davis, collected in South Carolina, and 400 specimens from A. A. Heller, collected in northern California and southern Oregon.

Through exchange.—290 specimens from Ira W. Clokey, Denver, Colorado, collected in Colorado, and 220 specimens of California mosses collected by Dr. M. A. Howe; also 300 duplicates from the Cosmopolitan Mitten Moss Herbarium, from the New York Botanical Garden.

Sixty-eight different correspondents sent in specimens chiefly for identification. The following are the most notable:

Mr. Ellsworth Bethel, Denver, Colorado, 281 from Denver and 21 from California and Nevada; Mrs. Mary Strong Clemens, 150 from Yosemite National Park and 401 from Plumas and Amador counties, California, and southern Oregon; J. August Kusche, 178 from Hawaiian Islands; Mrs. G. Earle Kelly, 65 from various parts of California; Mr. Vincent Jones, 72 from various parts of California; Mrs. Marian L. Campbell, 74 from various parts of California; Mrs. E. C. Sutcliffe, 88 from various parts of California; Howard E. Phelps, 50 from Pullman, Washington; and Ira C. Otis, 74 from Cascade Mountains, Washington.

The California State Floral Society gave a collection, chiefly of exotic ferns, made by the late Mrs. L. A. Hodgkins. It consists of 76 large mounted sheets and 171 smaller specimens, besides a small collection of flowering plants collected by the late George W. Dunn.

Dr. G. Dallas Hanna, besides his own collection of 76 specimens from Unalaska, induced Miss Danforth and Miss Miller, two Unalaska teachers, to collect for the Academy, and they added 18 specimens. Mr. E. C.

Johnston also collected 130 specimens and many duplicates on St. George Island at Dr. Hanna's suggestion. Mr. Eric Walther, who has been indefatigable in seeking for the different species cultivated in Golden Gate Park so as to label them under my supervision, has added about 450 specimens, chiefly exotics, many of them new to the collection.

The curator spent a short time in April along the southern boundary of the state and collected 285 species and duplicates. During the visit in June to attend the meeting of the Pacific Division of the American Association for the Advancement of Science at Seattle, a small collection of about ninety species was made around Seattle, and on a short trip to Victoria and Nanaimo, British Columbia, 247 species and duplicates were collected. Exceptional opportunities for collecting were given by the members of the British Columbia Biological Station, who offered both hospitality and guidance. Several small collections were made in Solano, Marin and San Francisco counties, chiefly in type localities.

Much time has been spent in naming the trees and shrubs in Golden Gate Park so as to correctly label them. In order to facilitate this work, books not in the Academy library are greatly needed as the plants in the park come from all parts of the world. About 600 species have been named and labels attached to 2000 plants. Some of the genera, such as *Acacia*, *Eucalyptus*, *Veronica*, *Escallonia*, and the bamboos have been very difficult. Duplicate specimens are being collected and prepared to send to the best authorities for verification of the identifications.

The care of the growing herbarium takes much time, and a great deal of the detail work falls on the curator. This prevents the accomplishment of original work which should be done.

The flower show in the vestibule fills a great want in the community. During the year hundreds of species of exotic and native plants are exhibited labelled with scientific and common name and native home. Without the care and attention of Mrs. Johanna E. Wilkens it would be impossible to keep this clean and attractive.

The California Botanical Club has about 60 members and holds meetings once a week either at the Academy or on an excursion to some place near the city. Its members help the herbarium in many ways, particularly Mrs. Marian L. Campbell and Mrs. E. C. Sutcliffe, who bring in specimens continually for the herbarium and the flower show. Mrs. Enid Reeves Michaels, one of the members now residing in the Yosemite Valley, has been keeping up a flower show in the valley throughout the season, at her own expense and by her own efforts. Recently, the Club has purchased for the Museum 360 pictures of California wild flowers photographed and colored with great skill and accuracy by Antone J. Soares. These will be installed soon so as to be on exhibition in the Museum.

Duplicates distributed.—230 to the Agricultural College, Buenos Aires, in exchange; 360 to the Royal Herbarium, Kew, for exchange; 205 to the Herbarium of the British Museum, for exchange; 300 to the Arnold Arboretum, for exchange.

All our *Senecios* have been sent to Dr. J. M. Greenman at the Missouri Botanical Garden, who is monographing the genus, and our undetermined

Carex have been sent to Kenneth M. Mackenzie, the authority at the New York Botanical Garden.

Continually throughout the year, the Curator has given informal talks on botanical subjects to various clubs in San Francisco and other places in order to educate the public in the love of nature, the knowledge of our flora and the necessity of protecting our native vegetation from wanton destruction.

The weekly class of the gardeners of the park is held in the evening at the herbarium. One of the members, Mr. Lewis Allen, has donated some fine photographs showing particular species of trees and shrubs in the park and all the members are most enthusiastic in bringing to the Academy all the new plants that are coming into flower or fruit. The collection of exotics raised in California out of doors that is gradually being accumulated in the herbarium of the Academy is one of its most important features and destined to make this herbarium the chief place of reference for the determination of exotics throughout the state.

ALICE EASTWOOD, *Curator*.

DEPARTMENT OF ENTOMOLOGY

As during the preceding three years the significant work done in the department of entomology in 1920 was the accumulation and classification of the insects of the western United States. Some interesting exotic material has been secured, of special note being a collection of 3570 moths from the Hawaiian Islands and 1500 beetles from the Amazon Valley. In our local fauna most advance has been made in the Lepidoptera, Diptera and Hemiptera. In the Lepidoptera large additions have been made to the collection of night-flying moths, and, with the exception of the smaller forms or micro-lepidoptera, most of our species have been determined and several of the families rearranged. The Geometridæ, especially, make an excellent showing with nearly 300 species, mostly from the west coast states. Determinations in this family have been made for us by Mr. W. S. Wright of San Diego and Mr. E. H. Blackmore of Victoria, B. C., both excellent authorities on these delicate and often beautiful "angle-wing" moths. Mr. E. A. Dodge of Santa Cruz and Mr. S. E. Cassino, of Salem, Mass., have given us many interesting forms of the genus *Catocala*, a group of showy moths with red or yellow underwings, of which the Academy now has 76 species. In the Diptera, or two-winged flies, much advance has been made. Mr. F. R. Cole, now at Stanford University, has been appointed associate curator in this order of insects and has done much to improve our collection by the determination and arrangement of our material. In this order the Academy collection now numbers 12,167 specimens, representing 876 named species. At least nine-tenths of this material has been added during the past four years. During the year the curator has devoted considerable time to systematic work on the order Hemiptera, or true bugs, and our collection in this order is now in very good condition. Of these insects we now have 15,472 specimens, repre-

senting 744 named species, with portions of two families yet to be worked up. As one result of his systematic work on the Hemiptera the curator has prepared descriptions of 50 new species and one new genus which are awaiting more favorable conditions for publication. Academy material in the order Orthoptera, which includes the grasshoppers, crickets and their relatives, has been determined by Mr. Morgan Hebard of Philadelphia, who also has added many eastern forms to our collection. Unfortunately, the lack of cabinet boxes precludes the possibility of arranging these interesting insects this year. Large additions have been made to the collection of Coleoptera, or beetles, but the complete reërrangement of these insects has awaited the publication of the new Leng Catalogue of Coleoptera.

Accessions to the Academy's collection of insects during the year 1920 number 24,861 specimens to which must be added 3,146 specimens in the Stretch collection, transferred as a permanent loan or deposit from the University of California, making a total of 28,007 additions for the year. Of this number, 9,525 were received as gifts from friends of the Academy, 5,062 were obtained by purchase, 3,146 as a permanent loan and 10,274 were added through field work by the curator. The mounting and labelling of this mass of material has consumed much of the time of the curator, although he was fortunate in having the help of Miss Helen Sanford for four months and of Mr. J. O. Martin for one month. Some of the principal gifts to this department received during the year were: from Mr. W. M. Giffard of Honolulu, 485 aculeate Hymenoptera from the Sierras; from Mr. Morgan Hebard of Philadelphia, 378 Orthoptera; from Mr. L. R. Reynolds, 138 Hemiptera from Mexico; from Maj. Chapman Grant of Oklahoma City, 150 insects; from Mr. E. A. Dodge, 423 moths; from Mr. C. L. Fox, 991 insects, largely from Siskiyou County, California; from Dr. E. C. Van Dyke 1717, mostly from the state of Washington; from Mr. J. E. Law, 450 from Arizona; and from Dr. G. Dallas Hanna, 2441 specimens from the Pribilof Islands, taken by him last summer, and perhaps the largest collection of insects ever taken on these islands at one time. Other valuable material has been received from Dr. F. E. Blaisdell, Mr. J. R. Leach, Dr. J. A. Comstock, Mr. J. O. Martin, Mr. S. E. Cassino, Mrs. E. P. Van Duzee, Mrs. H. E. Ricksecker, Mr. L. S. Slevin, Mr. J. R. Slevin, Mr. F. X. Williams, Mr. C. Howard Curran, Dr. R. Ottolengui and Mr. B. G. Thompson.

The field work of the curator during 1920 consisted of a trip to Half Moon Bay, April 12 to 13; a trip by automobile to San Diego, April 19 to 28, as guest of Mr. W. M. Giffard; one to Bryson, Monterey County, May 16 to 23; one to Sacramento, June 2 to 3, as guest of Mr. Giffard; a trip to Seattle and Forks, Washington and Vancouver Island, B. C., June 14 to July 14, and one to Santa Cruz, November 3 to 4, as guest of Mr. E. A. Dodge. In addition several short Sunday trips to nearby points have been taken and many evenings have been spent collecting moths at light about store windows in the city; and, thanks to the kindness of Miss Alice Eastwood, the curator was able to make use of her cottage on the slopes of Mt. Tamalpais for night collecting of moths during the whole month of March.

This department has received assistance in the determination of material from a number of specialists besides those already mentioned and has rendered assistance to others, principally by the determination of Hemiptera. The curator, during the past year, as a part of the work of his department, has been in more or less regular correspondence with over 125 individuals, mostly workers in the science of entomology.

But one paper by the curator has been published during 1920. This was issued as Vol. 9, No. 13, of the Proceedings of the Academy and contains descriptions of 28 new species of North American Hemiptera. Several later papers await opportunity for publication.

It is expected that the energies and resources of this department for the coming year largely will be absorbed by the proposed Academy expedition to Lower California and in the preparation and study of the material taken.

E. P. VAN DUZEE, *Curator*.

DEPARTMENT OF HERPETOLOGY

The Department of Herpetology during the year 1920 progressed satisfactorily, and the work accomplished compares favorably with that of previous years.

At the beginning of the year 1920 the Academy's collection of reptiles and amphibians numbered 40,038 specimens. There have been added during the year 1,466 specimens, so that the collection has grown to more than 41,000 specimens.

The number of specimens added during each of the past six years has been about as follows:

1915	800 specimens
1916	1500 "
1917	1600 "
1918	1724 "
1919	2666 "
1920	1466 "

Gifts of specimens during the year have been received as follows:

From Patrick H. McGee.....	3 specimens
" Gme de la Motte.....	1 specimen
" Mrs. J. E. Wilkins.....	2 specimens
" Dr. Barton W. Evermann.....	1 specimen
" H. H. Hunt.....	1 "
" Miss Marjorie D. Cole.....	1 "
" H. G. Huges.....	1 "
" Ralph Borden.....	1 "
" Dr. E. C. Van Dyke.....	13 specimens
" J. D. Flett.....	2 "
" Fred Maag.....	1 specimen
" J. R. Slonaker.....	2 specimens
" John O. Snyder.....	209 "
" F. X. Williams.....	30 "

268 specimens

Two collecting trips were undertaken to:

1. Carmel, Monterey County, and Campo, San Diego County, California.
2. Arizona.

Specimens have been secured from 12 counties of California, as follows:

Contra Costa	1 specimen
Kern	1 "
Los Angeles	1 "
Madera	2 specimens
San Benito	1 specimen
San Diego	7 specimens
San Francisco	1 specimen
San Joaquin	1 "
San Luis Obispo	1 "
San Mateo	5 specimens
Santa Clara	1 specimen
Sonoma	1 "

Specimens from other localities are:

Arizona	890 specimens
Connecticut	2 "
Idaho	18 "
Utah	217 "
Washington	9 "
Wisconsin	2 "
Australia	28 "
Celebes, D. E. I.	1 specimen
Hawaiian Islands	205 specimens
Laysan Island	5 "
Lower California	1 specimen
New Zealand	18 specimens
Philippine Islands	1 specimen
Vancouver Island, British Columbia	6 specimens

The classification and arrangement of the collection was continued during part of the year.

Considerable research work has been accomplished during the year and a further study of the gopher-snakes west of the Rocky Mountains has been published.

The snakes of the genus *Lampropeltis* were borrowed for study by Dr. Blanchard, and the lizards of the genus *Gerrhonotus* were studied by Mr. Ivan Johnston. Other students also made use of the collection.

During the year the Assistant Curator, Mr. J. R. Slevin, carried on explorations in California and Arizona, where he spent the months of May, June, July, August, and part of September, and secured large collections.

JOHN VAN DENBURGH, *Curator*.

DEPARTMENT OF INVERTEBRATE PALEONTOLOGY

The regular work of the Department of Invertebrate Paleontology is considerably varied in character because of the assembling therein of all the collections of fossil animals and plants, as well as those of the shells of living mollusks, and corals and the minerals, which belong to the Academy. While each group must necessarily receive a certain amount of care in order to make the collections readily accessible for study, the greatest attention of the personnel of the Department has been given to the living and fossil mollusks, particularly the latter. The vast Tertiary deposits of these organisms in California have attracted the attention of members of the Academy's staff since the organization of the institution. Although the valuable collections obtained prior to 1906 were destroyed in the fire, the activities of my predecessors and friends of the Academy have resulted in the building up of one of the largest West Coast series in existence. In the careful selection of the specimens and their orderly arrangement the collection is second to none.

The study of the fossil shells necessitates having related living forms for comparison, and generous friends have presented material from time to time, so that a very large and valuable working series of recent shells has been obtained. So far as West Coast material is concerned, the Academy's collection probably ranks third in importance at the present time.

Some specimens of fossil vertebrate animals are also contained in the collections, but throughout its history the Academy has preferred to leave this branch of the work to other institutions. This likewise has been true with regards to the fossil plants and the minerals.

Such varied and extensive collections require attention along the following lines: (1) The collection of additional material in the most important groups (field work); (2) The proper accessioning, cataloging, and classifying of the specimens; (3) The preparation and publishing of reports upon the collections for the use of the members of the Academy and others interested in this branch of science.

Three important field trips were made by the curator during the period covered by this report. Ten days in April were spent in San Benito County, California, in company with Mr. Joseph Mailliard, Curator of the Department of Ornithology. The collections of land and freshwater mollusks secured filled important gaps in our series. Search for fossils in the region proved unsuccessful.

The United States Bureau of Fisheries requested the services of the curator during the summer of 1920 to take the census of Alaska fur seals on the Pribilof Islands, a task to which he had been detailed annually since 1913. After careful consideration of the benefits which the Academy would derive from such a trip, it was decided best to accede to the wishes of the Bureau. The curator, therefore, took his departure on May 27, and, after an absence of about four months, returned on October 1. About one month of this time was occupied with actual fur-seal work, and the remaining available time was devoted to making collections in the branches

in which the Academy personnel is most interested. Besides the work done on the Pribilof Islands, specimens were obtained at Seattle, Unalaska, and Woody Island, near Kodiak, Alaska. Land and freshwater shells were secured at these places, and dredging was done whenever weather conditions would permit. The Department of Invertebrate Paleontology thus secured 3,000 specimens. In addition to these collections the attempted boring of an artesian well on St. Paul Island by the Navy Department furnished an opportunity to secure a continuous series of cuttings down to 100 feet below sea level. A very large collection of fossil diatoms thus resulted, the full importance and extent of which can not be estimated at this time.

The collections of birds, birds' eggs, insects and plants secured on this trip have been dealt with by the curators of the respective departments.

During the latter part of 1920 the Bureau of Fisheries made a further request for the presence of the curator at a conference on fur-seal matters, called for January 10, 1921, in Washington, D. C. That this request might be complied with, two weeks annual leave was granted. Entire approval was expressed with regard to the methods of census computation developed by the writer.

On the return from Washington a brief stop was made at Austin, Texas, where a large collection of recent land and freshwater shells, and marine Cretaceous fossils was secured. At the close of the year these specimens had not been assorted or classified.

The trip to Washington and return on Government transportation furnished an opportunity, which could not be overlooked, to visit an important, but little-known, Tertiary horizon in southern California at little expense to the Academy. This is in the general region of Carriso Creek, Imperial and San Diego counties. Dr. Roy E. Dickerson, the former curator, had borrowed the material from this locality which had been collected by the U. S. Geological Survey and the University of California, but had been unable to complete the study he contemplated. Upon looking into the matter with a view to returning the borrowed collections to their owners, their importance from a geological standpoint was very evident. Professor Bruce L. Clark, of the University of California, urged that the relations of the fossil fauna be determined, if possible. The best preserved specimens of the various species were accordingly taken to Washington, where direct comparisons could be made with closely related species from the West Indies and other places.

It then appeared more evident than ever that this deposit of shells and other fossils promised to reveal many unknown facts regarding the former connection of the Atlantic and Pacific oceans. A larger collection and better material were imperative; and at the time this report is being written, field work is in progress, and it is hoped that before it goes to press it will be possible to state briefly the success of the undertaking.

Besides the collections made by the curator, some others should be mentioned. Dr. Roy E. Dickerson brought to the Academy in 1920 an extensive series of marine shells from the Philippine Islands. Altogether

there are 1,470 specimens. Mr. Joseph R. Slevin brought some rare land shells from Arizona, where exploration was conducted in the interests of the Department of Herpetology. Dr. Barton Warren Evermann collected some beautiful specimens of lavas while he was in the Hawaiian Islands attending the meeting of the Pan-Pacific Scientific Conference. Several other minor collections were donated to the Academy, all of which are mentioned in the list of accessions following.

The proper cataloging and classification of a collection is almost as valuable work as the assembling of it, hence a great deal of attention has been devoted to this work. The card system is being used to list the various species, numbers of specimens, localities, etc., and an important beginning has been made upon a real inventory of the scientific material in the Department. Once this is completed there will be little difficulty in keeping it up to date; and, then in a short time, it will be possible to state how many species and specimens we have. At the present time this can not be done, although it would be very desirable.

The absence of the curator in Alaska for so long, prevented the writing of many papers on the collections. However, the work upon the Miocene freshwater shells from the ancient Petaluma Lake was completed. Also two reports upon fossil land shells of an Oregon deposit were written. Altogether the curator published six articles during the year.

Considerable progress was made in the indexing of references to west American land and freshwater mollusks. From the vast intricacies of the literature which thus become orderly assembled, it is hoped that a valid list of species may be extricated. One of the things already disclosed is the remarkable fact that no less than 125 specific and subspecific names have been applied in the common California land-snail genus, known as *Epiphragmophora*.

Our collection has continued to be actively used by other institutions, and it is hoped that in the future it will continue to prove equally attractive. Specimens which have been studied by specialists are believed to be of far greater value to a museum than those which repose indefinitely unidentified and untouched in their cases.

Under the able leadership of Professor Clark, the students of his classes in paleontology have found material collected by the Academy personnel many years ago, of great value in their work upon particular horizons. This is especially true of Mr. Howe, who is engaged upon faunas from Oregon and Washington. It is understood, informally, that the monograph of the western species of the genus *Turritella* by Miss Richardson has been completed, and that the material borrowed from the Academy will be returned as soon as the necessary photographs have been taken.

Miss Mary J. Rathbun, Associate in Zoology of the U. S. National Museum, has borrowed the Academy's collection of fossil crabs. She is the foremost authority on these crustaceans, and it is fortunate that our material may be identified by such an able and well-known student.

Dr. T. Wayland Vaughan, of the U. S. Geological Survey, visited the Academy in the summer of 1920, and requested the loan of some of our

Tertiary fossils to be used in connection with his studies of coastal plains geology. Others who have borrowed certain specified groups in past years, but who have not completed their studies at this date, are: Dr. Earl L. Packard, University of Oregon, Cretaceous fossils; Dr. S. S. Berry, Redlands, California, Chitons; and Dr. W. S. W. Kew, fossil sea urchins.

Faithful and very valuable assistance has been rendered in the Department by Messrs. Merle Israelsky and Georges Vorbe, students of the University of California, and by Mr. William Barbat of St. Mary's College.

G. DALLAS HANNA, *Curator*.

DEPARTMENT OF INVERTEBRATE ZOOLOGY

The collections have been increased by specimens collected by the Curator and Mr. W. S. Wallace of Monterey Bay. Mr. Wallace has specialized on hydroids and is naming the material as rapidly as acquired.

A trip to Vancouver Island which the Curator had intended to make in October had to be postponed until April on account of unfavorable tides and the closing of the Nanaimo Biological Station, which was to be used as a base of operations. The primary object of the trip was to study in life the shore and shallow-water sea stars, of which a considerable number of nominal forms have been described from that general region.

Dr. G. Dallas Hanna made a collection of sea stars, with extensive color notes, at St. Paul Island, Bering Sea, and at Unalaska, during the summer.

Dr. Gertrude Van Wagenen, who is studying at the Hopkins Marine Station, the corals and actinians of Monterey Bay, will contribute a set of named specimens.

W. K. FISHER, *Curator*.

LIBRARIAN'S REPORT

The growth of the library during the year 1920 was greater than during the preceding year, accessions having increased by purchase, by exchange and by gift. The low rate of foreign exchange made it seem advisable to place larger orders with European dealers and by this means many valuable sets were received at a very reasonable figure. Recovery from the European War has made possible the resumption of exchanges with many foreign societies, and lastly, more than the usual number of gifts have been received from friends of the Academy. Accessions to the library for the year number 1370 bound volumes, of which 526 were received by gift, 544 by purchase and 300 through exchange with other institutions. In addition to the bound volumes a large number of pamphlets and parts of volumes were received. By far the larger part of the books and pamphlets presented to the Academy library were from the Adolph Sutro library, received through the generosity of Doctors Geo. W. and Emma Sutro Merritt. This material from the Sutro library includes 402 bound volumes and 4248 miscellaneous numbers of government bulletins and reports and similar unbound material, besides a large number of separate papers, many of which will be useful later in completing sets. During the year 2200 volumes were accessioned, making the total number of volumes accessioned on December 31, 1920, 14,080.

Two new metal book stacks were erected in the basement library room, furnishing shelving space for 2400 volumes. This additional shelving has made it possible to relieve and rearrange some overcrowded subjects, thus adding materially to the orderly arrangement of the books stored in the basement room.

Work in the library department has, as in the two previous years, been in the hands of Miss McClellan and Mrs. Van Duzee, and to the faithful and efficient performance of the duties devolving upon these two is due the progress made in this department of the Academy's activities.

The collating, classification and cataloging has been completed in the series of publications of scientific societies and institutions issued in foreign languages, and in the subjects of engineering, chemistry, geography, mathematics, medicine, mining, ethnology and archæology and work on several other subjects is nearing completion. All current accessions also have been cataloged and placed on the shelves promptly as received. Use of the library by the Academy membership has shown a gratifying increase and it is hoped that with the improvement of the catalogue and the more systematic arrangement of the books on the shelves will come an increasing and more effective use of the books we have, both by the museum staff and the Academy membership in general.

E. P. VAN DUZEE, *Assistant Librarian.*

DEPARTMENT OF MAMMALOGY

As heretofore, this department has been coördinated with that of Ornithology, and what field work was accomplished was done incidentally with that in the latter department.

A succession of dry seasons in northern California made the collecting of small rodents a difficult matter on account of their scarcity, but a considerable number was obtained.

The Academy's collection of mammals had never been completely checked up, labelled, or entered upon the accession register, but this work is now nearly finished. Many of the large skins were only salted or dried, but the necessity for the better preservation of these very valuable specimens became so evident that Mr. H. W. Vogelsang was employed to tan them. The larger proportion of these have been so treated with most satisfactory results.

These skins have heretofore been stored in the ordinary metal cases in use for the smaller mammals, and therefore not readily accessible. It was decided to build a hide room in which to hang them when tanned. For this purpose a space has been enclosed in the vacant store room at the northwest corner of the Mammal Hall, in which all hides will be easily accessible for examination.

Gifts to the department have been made by Messrs. F. S. Townsley, J. R. Slevin, Chas. Budd, Geo. A. Bailey, W. C. Hackmeier, Dr. Saxton Pope, the Golden Gate Park authorities, and others, as shown in the List of Accessions.

JOSEPH MAILLIARD, *Curator.*

DEPARTMENT OF ORNITHOLOGY

Active work in this department has been carried on throughout the year. While most of this work has consisted in the classification, registration, and arrangement of specimens, several field trips were undertaken and some valuable contributions made to the knowledge of the distribution and migration of our birds. Two weeks in the early spring were spent in Monterey County, California, for the purpose of observing the unusual influx of Clarke's Nutcrackers reported from there, and for studying the juncos of that part of the state, and some valuable records were obtained. Another field trip was made in company with Dr. G. Dallas Hanna, of the Department of Paleontology, to whose valuable assistance this department is greatly indebted, into the region near "The Pinnacles," San Benito County, California, and to Pacheco and Panoche passes in order to note migrations. Interesting data were secured on this trip in connection with the spring migration of certain species and many specimens of birds and eggs were brought back.

The principal field trip of the year was to Siskiyou County, California, made in company with Mr. F. G. Gilchrist and Mr. Frank C. Holman, as assistants. Five weeks were passed in the field, the greater portion in camp at various spots. Although the very dry season had an unfortunate influence upon the bird life of the localities visited, the expedition gathered a number of specimens from a but little investigated part of the state, better defined the known habitats of several species of birds, and obtained some good records. The regions visited were localities west and north of the base of Mt. Shasta; Forest House Mountain, west of Yreka; and the Salmon Mountains, west of Greenview. Thanks are especially due to Mr. F. C. Holman, in the capacity of volunteer assistant, for his efforts to make the expedition a success.

Another field trip was made, in company with Mr. Chase Littlejohn, present assistant in this department, to the Mt. St. Helena range in Lake County, California, further to study the fall migration of fox sparrows. Fifteen days were spent in this work, and some very interesting observations were made, and numerous specimens secured.

The Curatorial work of the department has been principally that of cataloging and arranging specimens and bringing the card index up to date. The large increase in the number of specimens has necessitated the addition of fifteen metal cases for their installation, but, unless the near future brings unexpected fortune in the way of large donations, there should now be case room for the coming year, especially as a few cases will be freed from the mammalogical room.

The illness of Mr. Wm. Heim, who was mounting birds for the seasonal groups of the birds of Golden Gate Park, has delayed that work so that it is not yet systematically arranged, but a number of the birds of the park are in the cases, properly labelled, so that the public may profit thereby. Mr. Littlejohn has more specimens under way, and it is hoped to have these groups in fairly good shape within the next few weeks.

The principal donation to the department during the past year has been that of the W. Otto Emerson collection of study skins, consisting of some

5300 specimens, the life work of Mr. Emerson. This collection was purchased and donated to the Academy by Messrs. W. H. Crocker and John W. Mailliard. In this collection are many rare records for California, and, with the Mailliard collection, the Academy's representation of the land birds of this state is now placed on a good working basis for the use of all who may be interested in the study of ornithology.

Accessions to the Department of Ornithology proper are as follows:

Gifts:

W. H. Crocker and J. W. Mailliard (Emerson collection)	5300	specimens
J. W. Mailliard.....	22	"
James Moffitt	5	"
G. Dallas Hanna.....	106	"
F. C. Holman.....	9	"
E. F. Eastman.....	1	"
J. D. Baker.....	2	"
C. A. Allen.....	2	"
W. E. Scott.....	3	"
Golden Gate Park.....	3	"
J. D. Hubbard.....	2	"
Wm. Lewis	1	"
Ralph Borden	7	"
J. A. Kusche.....	13	"
Dudley de Groot.....	3	"
Mrs. Stanley	2	"
J. R. Slonaker.....	190	"
Dr. W. Winterberg.....	1	"
Mrs. Rhodes	3	"
Chas. Townsley	2	"
J. G. Grundel.....	1	"
Exploration, etc.	849	"
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Total accessions during the year 1920.....	6537	"
Total number of specimens in the Academy collections	38065	"

While this department was somewhat short-handed during the year, a great deal of work has been accomplished in the matter of rearranging the collection of birds for the reception of the large additions; and the installment of the oölogical collection is proceeding with reasonable speed.

JOSEPH MAILLIARD, *Curator*.

APPENDIX TO DIRECTOR'S REPORT

ACCESSIONS TO THE MUSEUM AND LIBRARY, 1920

Geological Survey of South Australia, Adelaide, Australia: Nine maps.
Gift.

- Allen, Mr. Lewis, Golden Gate Park, San Francisco: Twenty-three photographs of trees and shrubs and eight plants from Fresno. Gift.
- Ashly, Mrs. A. H., Stockton: One botanical specimen from Morada. Gift.
- Augsbury, Mrs. John C., San Francisco: Seven botanical specimens from Bartlett Springs. Gift.
- Bailey, Mr. George A., Golden Gate Park, San Francisco: One black gopher. Gift.
- Barbat, Mr. William F., San Francisco: Fossil shell conglomerate from Chase Camp, Mill Creek, Tehama County, probably Monterey Miocene in age. Gift.
- Bassinger, Mr. A. J., Agricultural College, Davis: Nine plants from California. Gift.
- Beck, Mr. Donovan Wayne, Burlington, Indiana: A collection of 15 bird eggs from Burlington, Indiana. Gift.
- Becker, Mr. J. O., Keeper, Año Nuevo Light, California: Two whale bones from Año Nuevo Island and three Indian spearheads from shore opposite Año Nuevo Island, San Mateo County. Gift.
- Bergman, Mr. Charles, San Francisco: Two botanical specimens from Ingleside for identification and one aquarium plant. Gift.
- Berry, Dr. S. Stillman, Redlands: Three paratypes of three new subspecies of land mollusks described recently in the Proceedings of the California Academy of Sciences, five land shells from southern California, and three land mollusks from Canada. Gift.
- Bethel, Mr. Ellsworth, Denver, Colorado: Fifteen specimens of *Ribes* from southern California, four botanical specimens from Nevada, 19 from California and 281 from Colorado. Gift.
- Blaisdell, Dr. F. E., San Francisco: Seventy beetles from various localities and three books (The International Scientist's Directory, Check List of North American Birds—E. Coues, and Pacific Railroad Report, Vol. IX). Gift.
- Blazic, Mr. Antone, Los Angeles: Twelve botanical specimens from Chico and Santa Barbara. Gift.
- Borden, Mr. Ralph, Alameda: Seven Australian parrots in flesh. Gift.
- Boston Society of Natural History, Boston, Massachusetts: Memoirs, three volumes; Occasional Papers, six volumes; Proceedings, 19 volumes. Gift.
- Brimley, Mr. C. S., Raleigh, North Carolina: Fifty-one salamanders, 10 frogs, eight snakes, and two lizards. Purchase.
- Brooks, Mr. Ben., Chicago, Illinois: Nine botanical specimens from Gary, Indiana. Gift.
- Bud, Mr. Charles, Golden Gate Park, San Francisco: One porcupine. Gift.
- Button, Mr. Fred L., Oakland: Four publications. Gift.
- Cain, Mr. B. C., Salt Lake City, Utah: Twenty-one snakes, 157 lizards, 23 frogs, and 16 toads from Utah; two frogs, one toad, five salamanders and ten snakes from Idaho. Purchase.
- California Botanical Club, San Francisco: One book. Gift.
- California State Floral Society, San Francisco: Sixty-two large sheets of mounted ferns, chiefly exotics and named, also 14 unnamed, 171 smaller specimens unmounted of both exotics and native ferns, and

- also 30 specimens of flowering plants collected by the late George W. Dunn. Gift.
- Gray Herbarium, Harvard University, Cambridge, Massachusetts: One book (*Florula Bostoniensis*.—Joseph Bigelow). Gift.
- Campbell, Mrs. Marian L., Mill Valley: Eight botanical specimens from Mill Valley and Los Altos, 40 from Lake Tahoe region and Sacramento, 18 from Solano County, and eight from Monte Rio. Gift.
- Cappleman, Mrs. O. C., Mill Valley: One botanical specimen from Washington. Gift.
- Cassino, Mr. S. E., Salem, Massachusetts: The *Lepidopterist*, Vols. II and III, Nos. 1-5. Gift.
- Chilton, Dr. Charles, Canterbury College, Christchurch, New Zealand: Thirty-three specimens of land and freshwater shells from the Hawaiian Islands. Gift.
- Clemens, Mrs. Joseph, Pacific Grove: One hundred and fifty specimens of plants from Yosemite National Park, 21 from Plumas, Shasta and Tehama counties, and 27 from other Pacific Coast localities. Gift.
- Clokey, Mr. Ira W., Denver, Colorado: Two hundred and ninety specimens of Colorado plants. Exchange.
- Cole, Miss Marjorie, Los Angeles: One botanical specimen. Gift.
- Coleman, Mr. R. A., San Francisco: Thirty specimens of marine mollusks from California, including a beautiful series of *Brachydontes demissus*, a mussel introduced from the East coast of the United States with the Oyster and now well established on the eastern side of San Francisco Bay. Gift.
- Crocker, Mr. Wm. H., and Mailliard, Mr. John W., San Francisco: The W. Otto Emerson collection of 5300 bird skins. Gift.
- Crocker, Mrs. William H., Burlingame: One bulla from Umma (Toklia) in South Babylonia. Gift.
- Crook, Dr. A. R., State Museum of Illinois, Springfield, Illinois: One book (*Guide to the Mineral Collections in the Illinois State Museum*.—Crook). Gift.
- Crowell, Mr. A. Russell, Mexico: Nineteen recent shells from Mazatlan Bay. Gift.
- Curran, Mr. C. Howard, Vineland Station, Ontario: Twenty specimens of Syrphidæ, including the types of 17 of his recently described species. Gift.
- Danford and Miller, Misses, Unalaska: Eighteen botanical specimens from Unalaska. Gift.
- Danmar, Mr. William, 5 McAuley Ave., Jamaica, New York: One book (*Modern Nervanaism*.—William Danmar). Gift.
- David, Mr. Evan J.: One book (*Leonard Wood on National Issues*.—Evan J. David). Gift.
- Davis, Rev. John, Hannibal, Missouri: One hundred and sixty botanical specimens from South Carolina. Purchase.
- Day, Mr. Charles E., Parker, Arizona: Two specimens of copper ore and two of cactus from Parker, Arizona. Gift.
- Dean, Mr. W. E., San Francisco: Sundry Academy publications. Gift.

- de la Motte, Mr. G. W., San Francisco: One Gila monster from near Roosevelt Dam, Arizona. Gift.
- Dickerson, Dr. Roy E., Manila, P. I.: Fifty-eight specimens of fossils and 16 freshwater shells from the Philippine Islands. Gift.
- Dodge, Mr. E. A., Santa Cruz: One hundred specimens of lepidopterous insects, all mounted and determined. Gift.
- Donohoe, Mrs. J. A., Menlo Park: Three botanical specimens from Menlo Park. Gift.
- Doubleday, Page and Company, Garden City, New York: One book (The Life of Leonard Wood.—John G. Holme). Gift.
- Eastwood, Miss Alice, California Academy of Sciences: One hundred and thirty-one botanical specimens from state of Washington; 280 specimens from British Columbia; 67 from northern California; 239 from southern California; and 56 miscellaneous specimens. Exploration.
- Edwards, Mr. George W., San Francisco: Eight volumes (Battles and Leaders of the Civil War, Vols. 1-8). Gift.
- University of Oregon, Eugene, Oregon: Six fossil land shells from Oregon. Gift.
- Evermann, Dr. Barton Warren, California Academy of Sciences: One specimen Chert from Año Nuevo Island; a series of lavas from Kilauea Volcano; 39 land shells from lava rocks not far from Kukuku, Hawaii; 101 marine shells and coral from Honaunau, Hawaii; 18 specimens marine mollusks from Año Nuevo Island; and a collection of 15 eggs and nests of California birds. Exploration. Seven trays of buttons showing the various processes in the manufacture of these articles from freshwater mussels; 14 shells of freshwater mussels from which buttons are made; 1 tray of waste from button factory after being ground for poultry food; eight natural pearls from freshwater mussels; Koninklijk Magnetisch en Meteorologisch Observatorium te Batavia, Verhandelingen, No. 5; 67 publications of the Academy; one botanical specimen from San Francisco, one from Hawaii, and one from Alaska collected in July, 1892. Gift.
- Faix, Mr. C. A., San Francisco: Two botanical specimens from San Francisco. Gift.
- Falkenau, Prof. Louis, Alameda: Sundry Academy publications. Gift.
- Flett, Prof. J. B.: One snake and one salamander from Washington State. Gift.
- Fox, Miss Anna P.: Seventeen botanical specimens from Inyo County. Gift.
- Fox, Mr. C. L., San Francisco: One hundred and four insects taken at Mount Rainier in July, 1919, and 887 insects from Siskiyou County. Gift.
- Friends of Irish Freedom, Washington, D. C.: One book. Gift.
- Gauthier-Villars et Cie., 55 Quai des Grands-Augustins, Paris, France: Eight books and pamphlets. Gift.
- Giffard, Mr. W. M., Honolulu, T. H.: Four hundred and eighty-five Aculeate Hymenoptera from the Sierras. Gift.

- Ghirardelli, Mrs. Domingo, San Francisco: Seed pods of various trees from Panama and two botanical specimens from Portland, Oregon. Gift.
- Gilbert, Mr. Arch M., Mill Valley: One botanical specimen from Sebastopol. Gift.
- Goodman, Dr. E., San Francisco: Three botanical specimens from San Francisco; 10 from Redwood Cañon and Piedmont and two from Mount St. Helena; two pieces of wood from the Petrified Forest and nine postal cards showing views of the Petrified Forest; and two other botanical specimens. Gift.
- Grant, Miss Adele L., Missouri Botanical Garden: Ten botanical specimens from Fresno. Gift.
- Grant, Major Chapman, Schofield Barracks, Honolulu, T. H.: One hundred and fifty insects from Oklahoma City. Gift.
- Grundel, Mr. J. G., Oakdale: One albino western robin in the flesh. Gift.
- Hackmeier, Mr. W. C., San Francisco: Two wild cats from Lassen County. Gift.
- Hahn, Mrs., San Francisco: One botanical specimen from Kings County. Gift.
- Hall, Dr. H. M., Berkeley: Twenty-seven unmounted and six mounted botanical specimens. Gift.
- Hallawell Seed Co., San Francisco: One botanical specimen from Dixon. Gift.
- Hanna, Dr. G. Dallas, California Academy of Sciences: Thirty-one marine mollusks from Moss Beach, California; 60 freshwater clams from Alaska; 15 freshwater clams from Washington; 3035 marine mollusks from Alaska and Bering Sea; 59 land and freshwater shells from the Bay Region of California and 2558 land and freshwater mollusks from San Benito County; 65 specimens of mollusks from Laguna Salada; 2441 insects from Pribilof Islands; 30 botanical specimens from Unalaska and 46 specimens from St. Paul Island; 130 plants collected by E. C. Johnston, from St. George Island, Alaska; one snake and one salamander from Contra Costa County; one snake from San Benito County; 10 skulls of Blue Foxes, three skulls of Steller's Sea Lion, 27 skulls of Fur Seals, two skulls and one skin of Hair Seal, and one skull of Reindeer, from St. Paul Island; two skulls of Polar Bears and one humerus of Polar Bear, from St. Matthew Island, Alaska; one skull of Kodiak Bear from Kodiak, and a few bones of Hair Seals from Alaska; 110 bird skins, 16 specimens of birds in formalin and 374 eggs from Alaska. Exploration. Sundry books and pamphlets. Gift.
- Hawver, Mrs. Elizabeth Parsons, Bolinas: Eight botanical specimens from Mount Hood region. Gift.
- Heath, Dr. Harold, Stanford University: One set (6 perfect eggs) of the Alaska Wren from St. George Island, Alaska. Gift.
- Heller, Mr. A. A., Chico: Four hundred botanical specimens from northern California and southern Oregon. Purchase.
- Herrin, Mr. William F., San Francisco: Seventeen botanical specimens from Shasta County and three specimens from Napa County. Gift.

- Hicken, Dr. Cristobal M., Buenos Aires, Argentina: Twenty miscellaneous separates by C. M. Hicken and one copy *Apuntes Historia Natural*, Vol. II. Gift.
- Hickman, Mr. J. B., Aromas: Two botanical specimens. Gift.
- Hildebrand, Mr. Samuel F., Key West, Florida: Nine snakes, four lizards, five frogs, one toad, and two turtles. Gift.
- Holladay, Mrs. E. B., San Francisco: Sundry papers and documents relating to the early history of the Academy; 13 books and pamphlets; a number of the early publications of the Academy. Gift.
- Holman, Mr. F. C., San Francisco: Eight bird skins. Gift.
- Howell, Mr. A. B., Pasadena: Eighteen mollusks from northwestern California. Gift.
- Hubbard, Mr. J. D., Chico: One Red-tailed Hawk in flesh. Gift.
- Israelsky, Mr. Merle C., San Francisco: Six oligocene fossils from San Lorenzo and 18 miocene fossils from vicinity of Walnut Creek. Gift.
- Jackson, Mrs. Bell R., San Rafael: Ten botanical specimens from Marin County. Gift.
- Jones, Mr. Vincent, San Francisco: Forty botanical specimens from Cedar Glen, Sierra County, and 32 from Vallejo, Suisun and Orwood. Gift.
- Jordan, Dr. David Starr, Stanford University: Thirty specimens of fossil fishes from the Diatomaceous deposits at Lompoc, and one from the Derby Dam, Truckee River, Nevada. Gift.
- Kelly, Mrs. G. Earle, Alameda: Forty-seven botanical specimens from Butte County; 17 from Plumas County, three from Monterey, and one from Alvarado. Gift.
- Kusche, Mr. J. August, San Francisco: One hundred and seventy-eight specimens of Hawaiian plants; 150 insects from Hawaiian Islands, mostly moths, and 67 moths taken at Burlingame. Gift.
- Law, Mr. J. Eugene, Museum of Vertebrate Zoology, Berkeley: Four hundred and fifty insects from southern California and Arizona. Gift.
- Leavy, Mr. Aiken, Golden Gate Park, San Francisco: Five botanical specimens from Niles Nursery. Gift.
- Lehrkind, Mr. O. F., San Francisco: Indian relics from Salt Lake District. Gift.
- Le Masters, Mr. C., Bisbee, Arizona: One specimen bog-iron covered by malachite stains, and mineralogical specimens 75 per cent. copper from Sacramento Hill, Bisbee, Arizona. Gift.
- Lewis, Mr. William C., Sausalito: One Great Blue Heron. Gift.
- Maag, Mr. Fred, San Francisco: One lizard from Kern County. Gift.
- Mailliard, Mr. John W. and Crocker, Mr. William H., San Francisco: The W. Otto Emerson collection of 5300 bird skins. Gift.
- Mailliard, Mr. John W., San Francisco: Twenty-two miscellaneous pamphlets. Gift.
- Mailliard, Mr. Joseph; Gilchrist, Mr. Francis; and Holman, Mr. F. C., California Academy of Sciences: Eighty-seven skins of small mammals, and 598 study skins of birds from California. Exploration.
- Mailliard, Mr. Joseph, California Academy of Sciences: Six hundred and ninety-nine freshwater shells from Sonoma and Siskiyou counties. Exploration.

- Biological Society of Washington, Proceedings, Vol. XXXII, pp. 207-234, 239-270, two pamphlets. Gift.
- Martin, Mr. J. O., Berkeley: Five hundred and eleven beetles. Gift.
- Masters, Mrs. Cornelia S., Pasadena: One botanical specimen from Yellowstone Park. Gift.
- McAllister, Mr. M. Hall, San Francisco: Framed photograph of charter members of the Cordelia Shooting Club, organized July, 1880. Gift.
- McLaren, Mr. John, Park Lodge, San Francisco: Five botanical specimens from Humboldt County; one deer and one bear in flesh. Gift.
- McLellan, Miss Mary E., Berkeley: Three hundred and seventeen marine mollusks from Monterey Bay, and 13 miscellaneous volumes. Gift.
- Meiere, Mrs. Ernest, Los Altos: Three botanical specimens from Los Altos, and four Japanese prints of flowers. Gift.
- Meierdierks, Miss Marie, Alameda: Forty specimens of Swiss Alpine plants. Gift.
- Department of Mines, Melbourne, Victoria, Australia: Two maps. Gift.
- Menzies, Mr. Robert, San Rafael: Four botanical specimens from San Rafael. Gift.
- Michaels, Mrs. Charles E., Yosemite: Five botanical specimens from Yosemite, and one from Mount St. Helena. Gift.
- Miller, Mrs. C. E., Berkeley: Four botanical specimens from Santa Cruz and Catalina islands. Gift.
- Miller, Mr. Irving, San Francisco: Nineteen botanical specimens from Pilot Knob, Inyo County. Gift.
- Mouzin, Mr. Nicholas, Golden Gate Park, San Francisco: Four botanical specimens from Tuolumne Meadows and Golden Gate Park. Gift.
- Moxley, Mr. George L., Los Angeles: One botanical specimen from the Sierra Nevada. Gift.
- Newell, Mrs. Gwendolyn, San Francisco: Sundry Academy publications. Gift.
- New Church Press, New York: Three books. Gift.
- New York Botanical Garden, New York: Three hundred and ninety-five specimens of mosses, duplicates of the Mitten collection from various places; and 220 specimens of California mosses, collected by Dr. M. A. Howe. Exchange.
- Nylander, Mr. Olof O., Caribou, Maine: Four pamphlets. Gift.
- O'Keefe, Mr. T. C., Golden Gate Park, San Francisco: A set of three eggs of the Nuttall Sparrow, from deserted nest in Golden Gate Park. Gift.
- Osterhout, Mr. George E., New Windsor, Colorado: Five botanical specimens from Colorado. Gift.
- Otis, Mr. J. C., Seattle, Washington: Seventy-four botanical specimens from Chelan and King counties, Washington. Gift.
- Paige, Mrs. George, San Francisco: Forty-one volumes. Gift.
- Pechart, Miss Ruth, Boulder Creek: One botanical specimen from Boulder Creek. Gift.
- Peers, Miss Susie, San Francisco: Sundry volumes. Gift.
- Perkins, Miss Janet, San Francisco: Thirteen botanical specimens from California. Gift.

- Geological Survey of Western Australia, Perth, Australia: Fourteen maps. Gift.
- Phelps, Mr. Howard E., Pullman, Washington: Fifty botanical specimens from Pullman. Gift.
- Phelps, Mrs. Kate E., San Francisco: Twenty plants from Leavenworth, Washington. Gift.
- Pope, Dr. Saxton, Butler Building, San Francisco: Four grizzly bear skins and skeletons from the Yellowstone Park. Gift.
- Porter, Dr. Charles B., San Francisco: One Japanese sword. Gift.
- Probert, Mrs., San Francisco: Five books and one pamphlet. Gift.
- Putnam's, G. P. Sons, New York: Six books. Gift.
- Putnam, Mrs. Osgood, San Francisco: Sundry Academy publications. Gift.
- Raspail, Mr. Xavier, Gouvieux, France: One book (Trente ans de critiques medicales et scientifiques.—Raspail et Pasteur). Gift.
- Reed, Mrs. C. A., Santa Cruz: Fourteen botanical specimens from Santa Cruz. Gift.
- Reynolds, Mr. L. R., Watertown, Massachusetts: One hundred and thirty-eight Hemiptera from Orizaba, Mexico. Gift.
- Rhodes, Mrs. M. B., Monterey: Three Western Evening Grosbeaks in flesh. Gift.
- Rixford, Mr. G. P., San Francisco: Four botanical specimens. Gift.
- Ruble, Mr. Russell, Geddes, South Dakota: A collection of nine bird eggs from Geddes, South Dakota. Gift.
- Ruddock, Mr. George T., Bakersfield: One botanical specimen from Bakersfield. Gift.
- Sayler, Mr. F. L., Berkeley: One hummingbird's nest. Gift.
- Schieffelin, Miss Rose G., Medford, Oregon: One botanical specimen from Medford. Gift.
- Seale, Mr. Alvin, Santa Cruz: Seven specimens of the Philippine window-shell, *Placuna plicenta*, from Manila Bay, P. I. Gift.
- Sessions, Miss Kate O., San Diego: Three botanical specimens from San Diego. Gift.
- Slevin, Mr. Joseph R., California Academy of Sciences: Thirty-one salamanders, one snake and two lizards; five salamanders from San Mateo County; 14 bats from Santiago, Lower California; 125 specimens of land mollusks from Arizona; one land shell from Lower California; a collection of eight bird eggs from Arizona. Exploration. Six photographs of desert plants. Gift.
- Small, Mr. E. C., Berkeley: One specimen of Vanadium ore from Arizona. Gift.
- Smith, Miss Emily, San Francisco: Two botanical specimens from Collinsville. Gift.
- Smith, Mr. L. E., Sisson: One botanical specimen from Siskiyou County; Flora of California, Parts 1-2 by W. I. Jepson. Gift.
- Stanford University, through Dr. David Starr Jordan: Five slabs of fossil fishes from Lompoc. Gift.
- Stanley, Mrs., Colusa: Two skins of Terns; and 20 botanical specimens from Korea. Gift.

- Stoney, Miss Kate D., San Francisco: Two botanical specimens from San Luis Obispo and one from the Grand Cañon. Gift.
- Sutcliffe, Mrs. E. C., San Francisco: One hundred and eighty-four specimens of cultivated and native plants of California. Gift.
- Geological Survey of New South Wales, Sidney, Australia: Two maps. Gift.
- Tableman, Mr. Fred, Newark, New Jersey: Two mounted radulæ of mollusks. Exchange.
- Thompson, Mr. David G., United States Geological Survey, Washington, D. C.: Seven botanical specimens from California. Gift.
- Townsley, Mr. F. S., Yosemite: One flying squirrel and two cardinals. Gift.
- Turner, Miss Laura A. L., Pasadena: One botanical specimen from Pasadena. Gift.
- Van Denburgh, Dr. John, California Academy of Sciences: One lizard from Pekin, China. Gift.
- Van Duzee, Mr. E. P., California Academy of Sciences: Seven hundred moths from Mount Tamalpais; 1298 insects from San Diego; 370 insects from Sacramento; 2672 insects from Monterey County; 411 insects from Marin County; 3823 insects taken in western Washington and on Vancouver Island during June and July. Exploration. One book. Gift.
- Van Duzee, Mr. E. P. and Mrs. Helen, California Academy of Sciences: Three hundred and eighteen insects from Half Moon Bay, San Mateo County. Exploration.
- Van Duzee, Mrs. Helen, California Academy of Sciences: Three hundred and eighty-three insects from western Washington and Vancouver Island. Gift.
- Van Dyke, Dr. E. C., University of California, Berkeley: Fifteen hundred and seventy-three insects from Vancouver Island and Washington, largely from Mount Rainier; 117 land shells from various parts of the United States and Canada; four salamanders and three frogs from Washington; six salamanders from Vancouver Island; and one land shell from Seattle. Gift.
- Walther, Mr. Eric, Golden Gate Park, San Francisco: Eight hundred and twenty-four cultivated and native plants of California. Gift.
- Walter, Mr. Frank, Los Angeles: Two botanical specimens from San Diego, one from Mount Wilson, 10 from Santa Barbara, and two from Los Angeles. Gift.
- Walter, Miss Henrietta, San Diego: One botanical specimen from San Diego. Gift.
- Carnegie Institution of Washington, Washington, D. C.: Publications Nos. 272, 282, 297, and 298. Gift.
- United States Department of Agriculture, Washington, D. C.: Two volumes of Academy's proceedings. Gift.
- United States Coast and Geodetic Survey, Washington, D. C.: Twenty-five maps. Gift.
- United States Department of Agriculture, Washington, D. C.: Four maps. Gift.

- Weeks, Dr. Alanson, San Francisco (through Mr. John C. Augsbury, San Francisco): Forty-four specimens of Eskimo workmanship, collected in Bering Sea about 1898-1900. Gift.
- West, Mr. Harry P., San Francisco: Seven botanical specimens from Plumas County. Gift.
- Westdahl, Mrs. F., San Francisco: Thirty-five specimens of ornamental shells. Gift.
- Wible, Mr. Curtis, Bakersfield: One botanical specimen from Bakersfield. Gift.
- Wilkins, Mrs. Johanna E., San Francisco: One botanical specimen from Golden Gate Park. Gift.
- Williams, Mr. F. X., Honolulu, T. H.: Ten adults and 2 pupæ of *Cellerio callida* from Hawaiian Islands, mounted and determined; 20 specimens of butterflies and moths from Arizona; 17 frogs, and 11 lizards from North Queensland, Australia; one lizard from Hawaiian Islands; and one snake from Philippine Islands. Gift.
- Wilson, Mrs. Arnott, Atlas: Three botanical specimens. Gift.
- Wilson, Mr. Charles J., London, England: Eighty-one study skins of birds from Malay States. Gift.
- Winterberg, Dr. Wolrad, San Francisco: One male Lewis Woodpecker. Gift.
- Wollenburg, Mr., San Francisco: One albino gopher in flesh. Gift.
- Wright, Miss Alice B., San Francisco: One specimen of *Pinus monophylla* from Nevada. Gift.
- Wright, Mrs. E., Calistoga: Two botanical specimens. Gift.

FINANCIAL STATEMENTS**REPORT OF THE TREASURER**

for the fiscal year ending March 31, 1921

April 1, 1920, Balance due Crocker National Bank \$2,111.47

Receipts

Dues	\$ 3,550.00	
Charles Crocker Scientific Fund Endowment In-		
come	1,318.84	
James Lick Endowment Income.....	53,076.83	
General Income	16,172.03	
John W. Hendrie Income Account.....	900.00	
Ignatz Steinhart Trust Interest.....	18,233.77	
Yosemite Game Paddocks Donations.....	505.00	
William C. Van Antwerp Donation.....	120.00	
William M. Fitzhugh Donation.....	200.00	
J. D. Grant Donation.....	100.00	
Albert Meyer Donation.....	250.00	
M. Hall McAllister Donation.....	1,000.00	
U. S. Treasury Certificates.....	24,000.00	
U. S. Treasury Certificates, Ignatz Steinhart Trust	9,000.00	
W. G. Wright Fund.....	66.50	
Interest	944.14	
Tools and Equipment.....	25.00	
Publication	209.85	
Sundry Advances	79.42	
Museum	108.40	
Library	7.97	
Post Card Sales.....	1,995.99	
		131,863.74
		<hr/>
		\$129,752.27

REPORT OF THE TREASURER—*Continued**Receipts*

Brought forward.....	\$129,752.27
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Expenditures

Expense	\$ 2,730.07
General Salary Expense.....	17,237.42
Legal Expenses	149.90
Bills Payable	10,000.00
Insurance	1,821.63
Interest	15,886.11
Museum, Department Appropriations.....	8,637.83
Museum, Department Appropriations, Salaries....	11,367.52
Library	2,026.37
Publication	4,067.94
Office Furniture	9.36
Tools and Equipment.....	57.25
Ignatz Steinhart Trust Interest.....	119.96
Steinhart Aquarium Preliminary Expense.....	2,190.85
U. S. Treasury Certificates, Ignatz Steinhart Trust	19,000.00
U. S. Treasury Certificates.....	27,000.00
Post Card Sales.....	424.60
Roosevelt Elk Group.....	10.75
Grizzly Bear Group.....	24.92
Sundry Creditors	2,088.37
Sundry Advances (Museum).....	5,529.73
Yosemite Game Paddocks.....	1,840.50
Contingent Fund	287.81
	<hr/>
	\$132,508.89

March 31, 1921, Balance due Crocker National Bank	\$ 2,756.62
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RUDOLPH J. TAUSSIG,

By C. E. GRUNSKY, *Treasurer*

Examined and found correct.

MCLAREN, GOODE & Co., *Certified Public Accountants.*

San Francisco, Cal., April 18, 1921.

INCOME AND OPERATING EXPENSES

For the Period April 1, 1920, to March 31, 1921

Income:

Charles Crocker Scientific Fund Endowment	
Income	\$ 1,318.84
James Lick Endowment Income.....	53,076.83
General Income	16,172.03
Dues	3,655.00

Expenditures:

General Expense	\$ 2,869.05	
Salaries	28,797.53	
Legal Expenses	149.90	
Interest	14,869.90	
Insurance	1,821.63	
Balance to Surplus Account.....	25,714.69	
	<hr/>	
	\$74,222.70	\$74,222.70

SUMMARY OF SURPLUS ACCOUNT

March 31, 1921

Balance March 31, 1920.....		\$335,115.60
Add Excess of Income over Operating Expenses. \$25,714.69		
Library Account, Purchases from W. G.		
Wright Fund in 1920-21.....	66.50	
John W. Hendrie Endowment Income.....	988.58	
Post Card Sales.....	1,229.28	
Albert Meyer Donation.....	150.00	
	<hr/>	28,149.05
		<hr/>
		\$363,264.65
Less Depreciation		14,885.88
		<hr/>
		\$348,378.77

IGNATZ STEINHART TRUST

March 31, 1921

Bequest from the Ignatz Steinhart Estate.....	\$250,000.00
Interest on temporary investments.....	21,962.44
Balance Investments over Receipts.....	31.12
	<hr/>
	\$271,993.56

Investments:

Steinhart Aquarium Preliminary Expense.....	\$ 2,993.56
Temporary Investments:	
Bills Receivable	250,000.00
U. S. Treasury Certificates.....	19,000.00
	<hr/>
	\$271,993.56

BALANCE SHEET

March 31, 1921

Assets

Real Estate:

Market Street Lot.....	\$600,000.00	
Jessie Street Lot.....	8,083.65	
Commercial Building	516,818.66	
		<hr/>
		\$1,124,902.31

Stocks:

60 Shares Savings Union Branch of the Mer-		
cantile Trust Co.		13,600.00

Ignatz Steinhart Trust:

Bills Receivable	250,000.00	
U. S. Treasury Certificates.....	19,000.00	
Steinhart Aquarium Preliminary Investment.	993.56	
Steinhart Aquarium Building Appropriation.	2,000.00	
		<hr/>
		271,993.56

U. S. Treasury Certificates.....	14,000.00
Museum Construction	191,690.92

Museum:

General Collections	102,268.49	
Tools and Equipment.....	24,134.15	
		<hr/>
		126,402.64

Library:

Books and Equipment.....	20,848.16	
Publication	25,712.44	
		<hr/>
		46,560.60

Office Furniture	3,338.69
Foreign Exchange	128.23

Sundry Advances:

Gulf of California Expedition.....	4,988.07	
Prager Herbarium	156.03	
Yosemite Game Paddocks.....	335.50	
		<hr/>
		5,479.60

Post Cards in Stock.....	3,266.96
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\$1,801,363.51

BALANCE SHEET—*Continued**Liabilities*

James Lick Endowment.....	\$804,902.31	
Charles Crocker Scientific Fund Endowment	20,000.00	
John W. Hendrie Endowment.....	13,600.00	
		\$838,502.31
Ignatz Steinhart Trust.....	250,000.00	
Ignatz Steinhart Trust, Interest Account.....	21,962.44	
		\$271,962.44
Alvord Bequest Botanical		5,000.00
A. K. Macomber Donation.....		3,500.00
William C. Van Antwerp Donation.....		5,120.00
William H. Crocker Donation.....		3,568.73
W. B. Bourn Donation.....		2,659.31
J. D. Grant Donation.....		2,710.42
Herbert Fleishhacker Donation.....		3,500.00
Ogden Mills Donation.....		5,000.00
John W. Mailliard Donation.....		1,250.00
S. Levi Donation.....		103.60
William M. Fitzhugh Donation.....		200.00
Bills Payable		290,000.00
Sundry Creditors		2,320.00
Cash:		
Overdraft with Crocker National Bank.....	2,756.62	
Less Cash in Safe.....	54.57	
		2,702.05
Depreciation		14,885.88
Surplus		348,378.77
		\$1,801,363.51

W. W. SARGEANT,

Secretary, Board of Trustees.

We have examined the foregoing Balance Sheet, together with the books and accounts of the CALIFORNIA ACADEMY OF SCIENCES, and in our opinion it is properly drawn up so as to exhibit a true and correct view of the Academy's affairs, as shown by the books.

McLAREN, GOODE & Co.,

Certified Public Accountants.

San Francisco, Cal.,
April 18, 1921.

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